CLAIMS

1. A recombinant vector comprising a recombinant DNA molecule comprising a DNA sequence that encodes a light emitting reporter protein, which DNA sequence is operatively linked to a regulatory element arranged to activate expression of the DNA sequence in response to DNA damage, wherein when used to transform a cell, the vector does not substantially alter the sensitivity of the cell to geneticin, when compared to the sensitivity of the cell which has not been transformed with the vector.

2. The recombinant vector according to claim 1, wherein the light emitting reporter protein is Green Fluorescent Protein or a light-emitting derivative thereof.

3. The recombinant vector according to claim 2, wherein the recombinant DNA molecule comprises a DNA sequence encoding the S65T derivative of Green Fluorescent Protein.

4. The recombinant vector according to claim 3, wherein the recombinant DNA molecule comprises a DNA sequence encoding a Yeast Enhanced derivative of Green Fluorescent Protein.

5. The recombinant vector according to any preceding claim, wherein the vector is designed to autonomously replicate in a cell.

6. The recombinant vector according to claim 5, wherein the vector contains DNA from the 2μ plasmid.

7. The recombinant vector according to any one of claims 1 to 4, wherein the vector is designed to integrate in the genomic DNA of a cell.

8. The recombinant vector according to claim 7, wherein the vector comprises DNA encoding for part of the HO gene from chromosome IV of a yeast.

9. The recombinant vector according to any one of claims 7, wherein the vector comprises sequences from the ribosomal DNA array of *S.cerevisiae.*

10. The recombinant vector according to any preceding claim, wherein the regulatory element comprises a yeast RAD54 gene.

11. The recombinant vector according to any one of claims 1 to 9, wherein the regulatory element comprises a yeast RNR regulatory element.

12. The recombinant vector according to claim 11, wherein the regulatory element comprises the RNR2 or RNR3 gene.

13. The recombinant vector according to any preceding claim, wherein the vector is a pFA vector.

14. A recombinant vector according to claim 1, comprising a light emitting reporter protein, a regulatory element and a non-functional kanMX module.

15. A recombinant vector according to claim 14, wherein the vector comprises a non-functional kanMX3 module.

16. A recombinant vector according to claim 15, wherein the KanMX3 module is disrupted with a deletion, substitution or addition.

17. A recombinant vector according to claim 1 comprising the vector of Figure 15 or a functional derivative thereof.

18. A recombinant vector according to claim 1 comprising the vector of Figure 24 or a functional derivative thereof.

19. A recombinant vector according to claim 1 comprising the vector of Figure 25 or a functional derivative thereof.

20. A recombinant vector according to claim 1 comprising the vector of Figure 34 or a functional derivative thereof.

21. A recombinant vector according to claim 1 comprising the vector of Figure 36 or Figure 38 or a functional derivative thereof.

22. A cell containing a recombinant vector according to any one of claims 1 to 21.

23. The cell according to claim 22, wherein the cell is a yeast.

24. The yeast according to claim 23, wherein the yeast is *Saccharomyces cerevisiae*.

25. The yeast according to claim 24 which is FF18984 or Y486 in haploid form.

26. A method of detecting the presence of an agent that causes or potentiates DNA damage, the method comprising subjecting a cell according to any one of claims 22-25 to an agent and monitoring the expression of the light emitting reporter protein from the cell, wherein an increase of the expression in the presence of the agent indicates that the agent causes or potentiates DNA damage.

27. The method according to claim 26, wherein the agent is further screened to assess whether it is safe to expose a living organism to the agent.

28. The method according to claim 26, wherein the agent is a candidate medicament, food additive or cosmetic.

29. The method according to claim 26, wherein the agent is a contaminant of water supplies.

30. The method according to claim 26, wherein the agent is a contaminant of industrial effluents.

31. The method according to claim 26, wherein expression of the light emitting reporter protein is measured from a whole cell.

32. The method according to claim 26, wherein the light emitting reporter protein is Green Fluorescent Protein.

33. The method according to claim 32 comprising growing cells transformed with a recombinant vector according to any one of claims 1 to 21, incubating the cells with the agent for a predetermined time and monitoring the expression of the Green Fluorescent Protein directly from a sample of the cells.

34. The method according to any one of claims 26-33, wherein the cells are grown in a low fluorescence growth medium.

35. The method according to claim 34, wherein the low fluorescence growth medium is F1 medium.

36. A method of generating a recombinant vector, the method comprising the steps of:-

(i) providing a vector backbone with a DNA sequence that encodes a light emitting reporter protein;

(ii) operatively linking the DNA sequence to a regulatory element arranged to activate expression of the DNA sequence in response to DNA damage;

(iii) providing the vector backbone with a selectable marker arranged to confer resistance to geneticin; and

(iv) rendering the selectable marker non-functional, wherein when used to transform a cell, the vector does not substantially alter the sensitivity of the cell to geneticin, when compared to the sensitivity of the cell which has not been transformed with the vector.